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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/541,224

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Poul E. Nielsen

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EXAMINER

LAO, MARIALOUISA

ART UNIT

PAPER NUMBER

1621

MAIL DATE

DELIVERY MODE

11/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/541,224

Applicant(s)

NIELSEN ET AL.

Examiner

M. Louisa Lao

Art Unit

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/01/2005</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites a cooled process stream to 20-200°C; it is unclear, however, what the initial or conversion temperature is relative to the converted process stream.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Struder (US5179129, US'129) in view of Laxier et al. (US1984884, US'884) and further in view of Dunn et al. (US254899, US'899).

7. The instant claims are drawn to process for production of methanol comprising *inter alia* the conversion of a feed stream into a converted process stream in the presence of a catalyst (Cu) active in the conversion of hydrogen, carbon monoxide and carbon dioxide into methanol; cooling of said converted process stream to a cooled process stream to 20-200°C; hydrogenation of the cooled process stream into a hydrogenated process methanol-rich stream in the presence of a hydrogenation catalyst (Cu-based); cooling of said hydrogenated process methanol-rich stream and phase separation of the cooled, condensed process stream into a gas phase and a liquid crude methanol.

8. US'129 teaches the methanol production utilizing a two-stage slurry reactor system where a specific reaction takes place in each reactor which results in substantial increases in methanol yields (see column 1 lines 37-45). The staged process comprises feeding synthesis gas containing hydrogen, carbon monoxide, and carbon dioxide into the first stage reactor, withdrawing a stream containing methanol and unreacted syngas components, cooling the stream and recovering additional methanol product from the second stage reactor, and recovering

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additional methanol product from the second stage reactor effluent stream (see column 1 lines 47-52). Heat is removed from the first and second liquid phase reactors to control the respective temperatures therein by indirect heat exchange with syngas feed, steam, or boiler feedwater in a first and second heat exchanger located respectively within the first and second reactors (column 3 lines 28-37). US'129 teaches that the optimum temperature in a liquid phase methanol reactor is determined by a balance of between the kinetic reaction rate, catalyst deactivation rate, and thermodynamic equilibrium. Higher temperatures yield higher kinetic reaction rates while lower temperatures result in thermodynamic equilibrium, which favors methanol concentrations in the reactor product (column 8 lines 62-68). US'129 teaches by schematic flowsheets in column 5 lines 40-68 bridging to column 6 lines 1-68 the process wherein the catalyst can be a powder suspended in a liquid (column 6 line 16) or a pellets (column 6 line 26).

9. The difference between the instant claims and US'129 is the reference of the former to by-products in the methanol synthesis of aldehydes and ketones and their conversion into alcohols.

10. US'884 is relied upon to show, at the time of Applicants' invention, that aldehydes and ketones are formed in conjunction with the hydrogenation of oxides of carbon (see column 1 lines 4-27). US'884 teaches that the process favors the formation of lower alcohols, particularly methanol, and other oxygenated compounds such as ketones and aldehydes, when the ratio of carbon monoxide to hydrogen is low. The catalyst used is of the platinum group (column 1 line 31).

11. The difference between the instant claims and US'129 and US'884 is the conversion of the aldehydes and/or ketones to their corresponding alcohols by hydrogenation. US'899 is relied

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upon to show the state of the art at the time of Applicants' invention regarding the hydrogenation of aldehydes and ketones (see column 3 lines 33-53) from methanol at 100-275°C. US'899 teaches the catalytic hydrogenation of aldehydes and/or ketones to their corresponding alcohols at temperatures around 180°C (column 3 line 43).

12. One of ordinary skill in the art at the time of the invention would have found it obvious to utilize the hydrogenation process of US'899 with US'129's method of making methanol since the methanol process would invariably have aldehyde and/or ketone by-products as taught by US'884, in addition to the explicitly taught unreacted and recovered syngas.

13. The artisan of ordinary skill would be motivated to employ the hydrogenation process of US'899 in US'129's method of making methanol since both cited prior art references are geared towards the efficacious ways of increasing methanol yields, whereupon reduction of byproducts would lead to a reasonable expectation of success.

The claim would have been obvious because "a person of ordinary skill has a good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product, not of innovation, but of ordinary skill and common sense.

The use of different, but analogous reactants in an old process, does not render the process itself unobvious. *In re Durden et al.* 226 U.S.P.Q. 359.

14. No claims are allowed.

### *Correspondence*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MLouisa Lao whose telephone number is 571-272-9930. The examiner can normally be reached on Mondays to Thursdays from 8:00am to 8:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair->

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direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MLouisa Lao  
Examiner  
Art Unit 1621

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